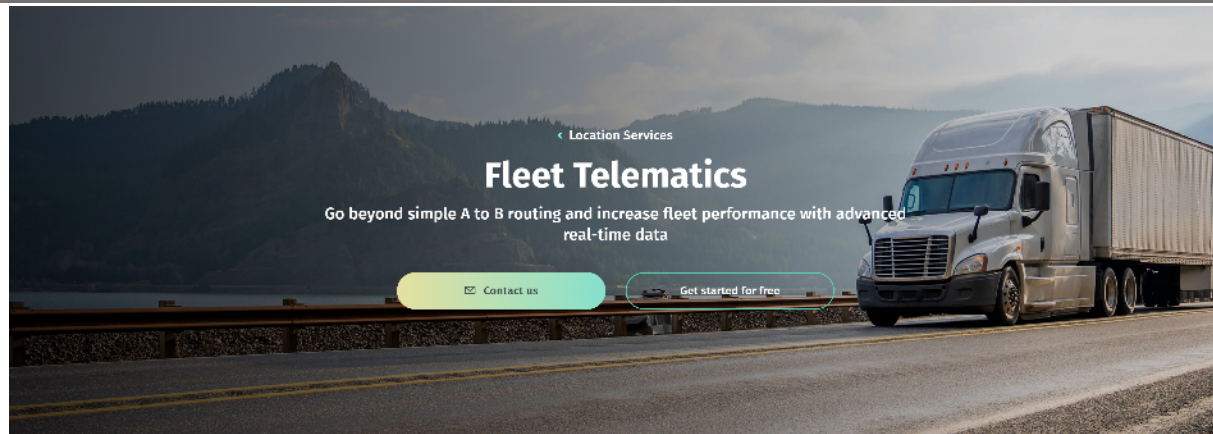


**EXHIBIT E****UNITED STATES PATENT NO. 8,948,784****CLAIM CHART FOR INFRINGEMENT OF REPRESENTATIVE INDEPENDENT CLAIM 1**

Note: This representative claim chart is provided solely for pleading purposes in this action and is based upon information known at this time. This chart does not represent Plaintiff's infringement contentions, the asserted claims, or all of Plaintiff's allegations regarding infringement. Plaintiff further reserves the right to assert additional or different theories of infringement, including infringement under the doctrine of equivalents.

*Infringement analysis provided for any preamble should not be construed as an admission that such preamble is limiting.*

<b>US8948784</b>	<b>HERE Fleet Telematics Geofencing (The accused instrumentality)</b>
1. A computer-implemented method of assessing whether a mobile device is in a geospatial area, the method comprising:	To the extent the preamble is limiting, the accused instrumentality offers a method for assessing (e.g., location of the asset) whether a mobile device (e.g., smartphone, laptop, tablet or other handheld device, delivery package, car etc.) is in a geospatial area (e.g., through its built-in GPS and other location based sensors). Defendant offers a Geofencing API called HERE Fleet Telematics Geofencing (REST API) for its customers to access a diverse and rich set of location features designed to support some of the most complex use cases related to routing, search and map data retrieval. It enables geo-fence defining capabilities using the user's mobile's built-in sensors such as GPS, accelerometer and other location based sensors. Defining the geo-fences helps to determine a mobile device context information and provide results or notifications to its customers about the mobile assets.



Source: <https://www.here.com/products/location-based-services/fleet-telematics>

#### What Is the Fleet Telematics Geofencing?

The HERE Fleet Telematics Geofencing is a REST API that allows you to track whether or not mobile assets are located within the specified geographic areas. An asset is any kind of trackable object, such as a person, car, smartphone, or delivery package.

You can define the geographic areas as geometries in the form of geographic polygons, polylines, or points that are relevant for these assets.

You can also choose to check the assets' position against Map layers, for example country boundaries, postal code boundaries or census boundary layers.

Feature	Description
<u>Close access to certain areas in cities</u>	Based on various requirements, you can specify areas in a city as no-go areas for assets at certain times of the day or week. For example, if the assets should avoid areas with heavy traffic during peak hours. For each asset group, there is a static set of polygons defined where the assets and/or management system is alerted if an asset approaches or enters the no-go area. These polygons can have individually defined validity periods.

Source: [https://developer.here.com/documentation/geofencing/dev\\_guide/topics/what-is.html](https://developer.here.com/documentation/geofencing/dev_guide/topics/what-is.html)

## Get Started

The HERE Fleet Telematics API REST API allows customers to access a diverse and rich set of location features designed to support some of the most complex use cases related to routing, search and map data retrieval.

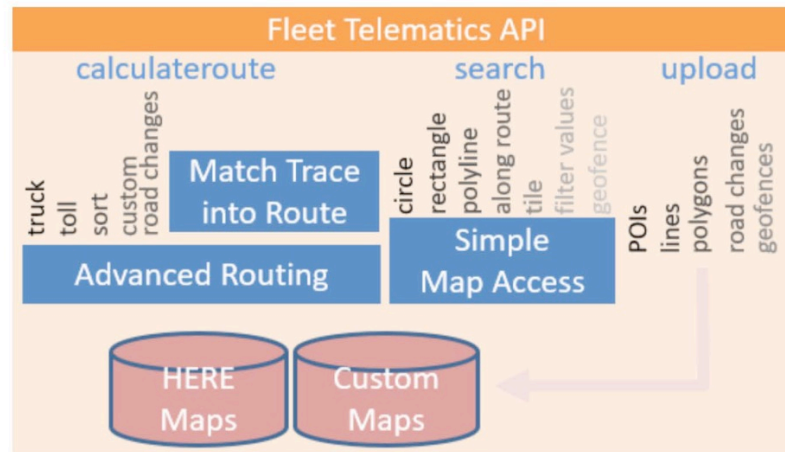


Figure 1. Overview

Source: [https://developer.here.com/documentation/fleet-telematics/dev\\_guide/index.html](https://developer.here.com/documentation/fleet-telematics/dev_guide/index.html)

Feature	Description
Notify the car rental agency if an asset enters a forbidden country or area	<u>Certain groups of rental cars have a restricted set of countries or areas where their use is permitted, due to insurance or security reasons. In this case, you can define a few static polygons that extend across a large geographic area with a fine grained resolution (number of vertices) per asset group. Or you can simply use the existing PDF country boundary layer as geofences.</u>

Source:

[http://documentation.developer.here.com/pdf/geofencing\\_hlp/2.5.9/Fleet%20Telematics%20Geofencing%20v2.5.9%20Developer's%20Guide.pdf](http://documentation.developer.here.com/pdf/geofencing_hlp/2.5.9/Fleet%20Telematics%20Geofencing%20v2.5.9%20Developer's%20Guide.pdf)

	<p><b><u>Map Layers as Geofences</u></b></p> <p><u>Geofences can be custom defined objects, but Fleet Telematics Geofencing also allows to geofence on all map content.</u> Examples:</p> <ul style="list-style-type: none"> <li>• <u>Check whether the asset is in woodland, builtup, lake, ocean, park, hospital, beach or airfield.</u> Therefore geofence against the corresponding PDE cartographic polygon layers.</li> <li>• <u>Check whether the asset is close to a restaurant, hotel, train station or fuel station.</u> Therefore geofence against the corresponding PDE Point of Interest layers.</li> <li>• <u>Check whether the asset is on or close to a railway line, small river line or country border line.</u> Therefore geofence against the corresponding PDE cartographic line layers.</li> <li>• <u>Check whether the asset is on a motorway, federal road, small road or pedestrian path.</u> Therefore geofence against the corresponding PDE road geometry layers, and join PDE road information layers.</li> </ul> <p>Please refer to the PDE Developer Guide for available layers. Geofencing on maps uses the same resources as geofencing on custom polygons, but a different service endpoint.</p> <p>Source: <a href="https://developer.here.com/documentation/geofencing/dev_guide/topics/map-layers-as-geofences.html">https://developer.here.com/documentation/geofencing/dev_guide/topics/map-layers-as-geofences.html</a></p>
receiving, at a mobile device, a representation of a non-circular geospatial zone;	<p>The accused instrumentality offers a method to receive a representation of a non-circular geospatial zone (e.g., through Map Layers of the HERE Geofencing Extension API. More specifically, a mobile device receives the representation of a non-circular geospatial zone through maps. Users access device location through GPS and maps. Geofencing continuously tracks location and further checks the asset position on the map).</p>

**What Is the Fleet Telematics Geofencing?**

The HERE Fleet Telematics Geofencing is a REST API that allows you to track whether or not mobile assets are located within the specified geographic areas. An asset is any kind of trackable object, such as a person, car, smartphone, or delivery package.

You can define the geographic areas as geometries in the form of geographic polygons, polylines, or points that are relevant for these assets.

You can also choose to check the assets' position against Map layers, for example country boundaries, postal code boundaries or census boundary layers.

Source: [https://developer.here.com/documentation/geofencing/dev\\_guide/topics/what-is.html](https://developer.here.com/documentation/geofencing/dev_guide/topics/what-is.html)

**Map Layers as Geo Fences**

In addition to creating customer specific proprietary private layers, customers can also use map layers as geo fences. For example, postal code polygons, country boundary polygons, railroad track or road lines, lakes and river polygons + polylines or points of interest can be used for geo fencing.

Map layer coverage = PDE coverage: All map layers for all geographic regions for all map releases are available for geo fencing that PDE offers.

Please note that different commercial terms apply for using map layers as geo fences.

Source:

[http://documentation.developer.here.com/pdf/geofencing\\_nlp/1.1/Geofencing%20Extension%20API%20v1.1%20Developer's%20Guide.pdf](http://documentation.developer.here.com/pdf/geofencing_nlp/1.1/Geofencing%20Extension%20API%20v1.1%20Developer's%20Guide.pdf)

## Basic Positioning

HERE Android SDK provides the following interfaces for users to retrieve location updates and to display their current location on a map:

- `PositioningManager`
- `OnPositionChangedListener`
- `PositionIndicator`

**Note:** Android permission `android.permission.ACCESS_FINE_LOCATION` is required when your app calls `PositioningManager.start(LocationMethod)`. Otherwise, the method returns `false`. In addition, to ensure that the app receives location updates, the user needs to have the Location permission enabled (toggled to "on") during runtime.

## PositioningManager Class

A `PositioningManager` class provides information related to the device geographical location like the current position and the average speed. Applications can register to receive position updates using one of the positioning mechanisms described in the `LocationMethod`:

- `GPS` - positioning using the real GPS available on the device
- `GPS_NETWORK` - positioning is provided using a wireless network or the real GPS available on the device
- `NETWORK` - positioning using a wireless network

The current status of a particular location method is represented by the `LocationStatus` value returned from the `PositioningManager.getLocationStatus(LocationMethod)` method.

`PositioningManager` can be accessed by calling `PositioningManager.getInstance()`. An application can start receiving real time positioning updates by calling `PositioningManager.start(LocationMethod)` with one of the location methods listed above and can stop positioning updates by calling `PositioningManager.stop()`. While position updates are being received, an application can retrieve the current position of the client device via `PositioningManager.getPosition()` method.

By default the position indicator is rendered as a marker surrounded by a circle, the diameter of which illustrates the accuracy of the indicated position. You can change this marker by calling `PositionIndicator.setMarker(Image)`.

*Figure 1. A PositionIndicator*



Source: [https://developer.here.com/documentation/android-starter/dev\\_guide/topics/map-positioning.html](https://developer.here.com/documentation/android-starter/dev_guide/topics/map-positioning.html)

## Maps and Layers

### Maps

Fleet Telematics API is based on and offers simple on access to all HERE map data and customers' private map data. Therefore the Fleet Telematics API works with multiple maps, e.g.:

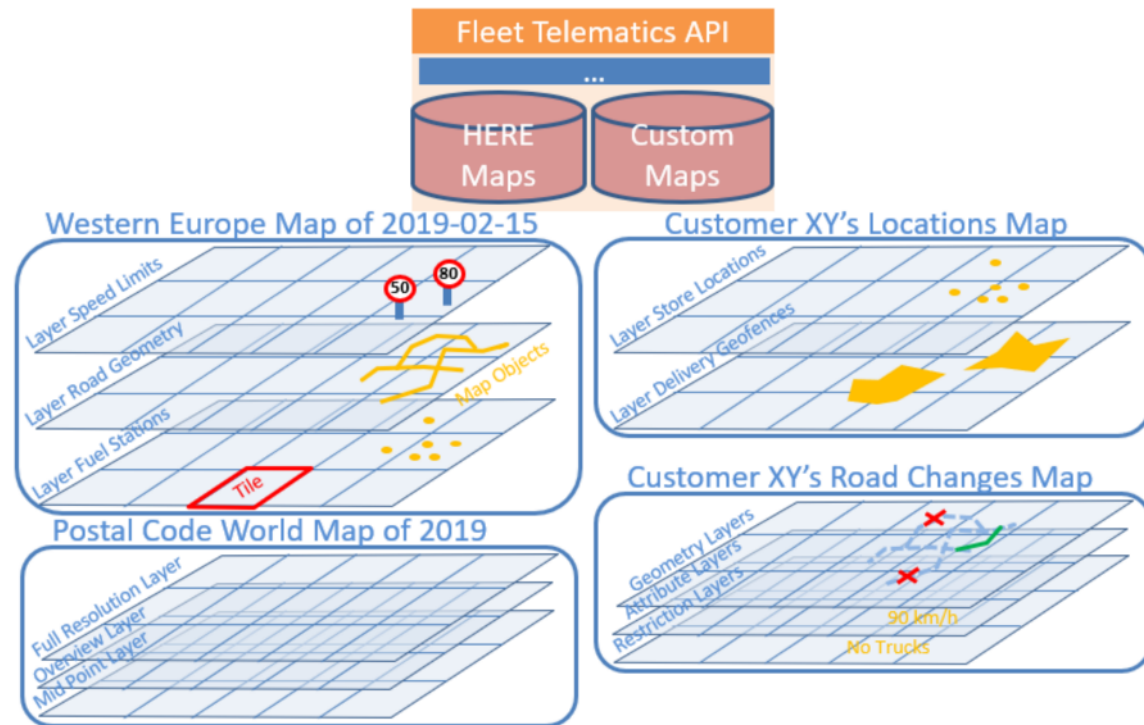


Figure 1. Examples of Maps

Source: [https://developer.here.com/documentation/fleet-telematics/dev\\_guide/topics/here-map-content.html](https://developer.here.com/documentation/fleet-telematics/dev_guide/topics/here-map-content.html)

causing storage of the representation of the non-circular geospatial zone in a memory of the mobile device;

Upon information and belief, the accused instrumentality causes storage of the representation of the non-circular geospatial zone in a memory of the mobile device (e.g., via Maps and layers part of Fleet telematics API, Data Hub API, Tracking API etc.).

#### **“Map Objects**

##### **Maps**

**All map objects are stored in maps.** There is a default map for each customer, but customers can create many maps. A map is a collection of layers.

##### **Layers**

**A layer can store a logical group of map objects. Customers can create many layers within each map. Which map objects should reside within the same layer, and which map objects should go into different layers, is application specific.** As a rule of thumb, the objects that are being searched / displayed / updated together should go together into one layer.”

#### **“Map Storage**

**There are two storage types available for maps: Updatable and Read-only. Updatable, which is the default storage type, offers all features at a good performance.**

**You should only choose Read-only for large maps that rarely change, as they have these limitations:**

**Read-only maps can only be uploaded as a whole; you cannot add further layers or modify objects in these layers. Instead, you have to upload the whole map again.**

**Uploading a Read-only layer into an existing map deletes the old layer in that map”**

Source: [https://developer.here.com/documentation/custom-location/dev\\_guide/topics/map-objects.html](https://developer.here.com/documentation/custom-location/dev_guide/topics/map-objects.html)  
(emphasis added)

## Map Storage

There are two storage types available for maps: "updatable" and "readonly". You can insert/update/delete individual records and append records in "updatable" map storage. Maps in "readonly" storage cannot be modified. Instead, the full map must be uploaded again.

Updatable is the default storage for custom maps, while road overlay maps are always stored in "readonly" storage. Choose "readonly" for large maps that rarely change, because it offers higher search and retrieval performance.

Source: [https://developer.here.com/documentation/fleet-telematics/dev\\_guide/topics/here-map-content.html](https://developer.here.com/documentation/fleet-telematics/dev_guide/topics/here-map-content.html)

[Data Hub API](#)

[A REST API for location data management that allows developers to store, edit and retrieve geospatial data more efficiently.](#)

[Tracking API](#)

[Store and retrieve the location and user-defined telemetry of IoT devices for real-time and historical tracking and geofencing.](#)

Source: <https://developer.here.com/develop/rest-apis>

	<p><b><u>HERE Map Data Download</u></b></p> <p><u>Some key functionality offered through HERE SDK depends on HERE Map Data being downloaded and cached on the device. Rendering a map on the screen, for example, is not possible without first downloading map data to the device.</u> Similarly, it would not be possible to provide accurate turn-by-turn navigation without downloading map data to the device. Offline operations such as offline routing and search also require map data to be downloaded to the device in advance. This section describes different approaches you can take to manage map data download.</p> <p><b>Map Data Download Example on GitHub</b></p> <p>You can find an example that demonstrates this feature at <a href="https://github.com/heremaps/">https://github.com/heremaps/</a>.</p> <p><b>Passive Download Approach</b></p> <p><u>The passive approach is where you allow the SDK to download map data as needed. A typical example is when a user pans the map and triggers an on-demand map data download to render the map.</u></p> <p><u>Map data downloaded in this way is stored in a persistent cache with a default size of 256 MB. Cached map data can be used for offline operations, in cases where a network connection is not available or not desired,</u> such as when the device is in roaming mode. However, there is no way for you to know if sufficient data has been downloaded to enable all offline operations, such as offline search or routing.</p> <p>Source: <a href="https://developer.here.com/documentation/android-premium/dev_guide/topics/map-data.html">https://developer.here.com/documentation/android-premium/dev_guide/topics/map-data.html</a></p>
<p>determining, based at least in part on the non-circular geospatial zone, an outer circular boundary entirely encompassing the non-circular geospatial zone, wherein the outer circular boundary is defined by at least a</p>	<p>The accused instrumentality determines based at least in part on the non-circular geospatial zone (e.g., Maps) an outer circular boundary entirely encompassing the non-circular geospatial zone wherein the outer circular boundary is defined by at least a centroid of the non-circular geospatial zone and a maximum radius (e.g., MapCircle class part of HERE SDK. This can circle an entire country or a region or Earth' surface. Thus, it is implied that the circle entirely encompasses the non-circular geospatial zone).</p>

centroid of the non-circular geospatial zone and a maximum radius;

### **Map Layers as Geofences**

Geofences can be custom defined objects, but Fleet Telematics Geofencing also allows to geofence on all map content. Examples:

- Check whether the asset is in woodland, builtup, lake, ocean, park, hospital, beach or airfield. Therefore geofence against the corresponding PDE cartographic polygon layers.
- Check whether the asset is close to a restaurant, hotel, train station or fuel station. Therefore geofence against the corresponding PDE Point of Interest layers.
- Check whether the asset is on or close to a railway line, small river line or country border line. Therefore geofence against the corresponding PDE cartographic line layers.
- Check whether the asset is on a motorway, federal road, small road or pedestrian path. Therefore geofence against the corresponding PDE road geometry layers, and join PDE road information layers.

Please refer to the PDE Developer Guide for available layers. Geofencing on maps uses the same resources as geofencing on custom polygons, but a different service endpoint.

Source: [https://developer.here.com/documentation/geofencing/dev\\_guide/topics/map-layers-as-geofences.html](https://developer.here.com/documentation/geofencing/dev_guide/topics/map-layers-as-geofences.html)

The response to the above request includes the following high level elements:

- List of geoshapes (called **geometries** in the response) with the distance between the geocoordinate and the closest border of the geofence (a negative value indicates the position is inside, a positive value outside of the indicated shape).
- Metadata about the request

```
{
  "geometries": [
    {
      "attributes": {
        "ID": "1",
        "GEOMETRY_ID": "0",
        "NAME": "Alexanderplatz",
        "ABBR": "AL"
      },
      "distance": -99999999,
      "nearestLat": 0,
      "nearestLon": 0,
      "geometry": "MULTIPOLYGON(((13.41252 52.52228,13.41426 52.5221,13.41522 52.52113,13.41227 52.51981,13.41252 52.52228)))"
    }
  ],
  "response_code": "200 OK"
}
```

Source:

[http://documentation.developer.here.com/pdf/geofencing\\_hlp/2.5.9/Fleet%20Telematics%20Geofencing%20v2.5.9%20Developer's%20Guide.pdf](http://documentation.developer.here.com/pdf/geofencing_hlp/2.5.9/Fleet%20Telematics%20Geofencing%20v2.5.9%20Developer's%20Guide.pdf)

### “MapCircle

A **MapCircle** represents a type of **MapObject** in the shape of a circle with an assigned radius distance and a **GeoCoordinate** center. It can be created by calling the constructor **MapCircle(double radius, GeoCoordinate center).**”

Source: [https://developer.here.com/documentation/android-starter/dev\\_guide/topics/map-objects-and-interaction.html](https://developer.here.com/documentation/android-starter/dev_guide/topics/map-objects-and-interaction.html)

“Active Download Approach

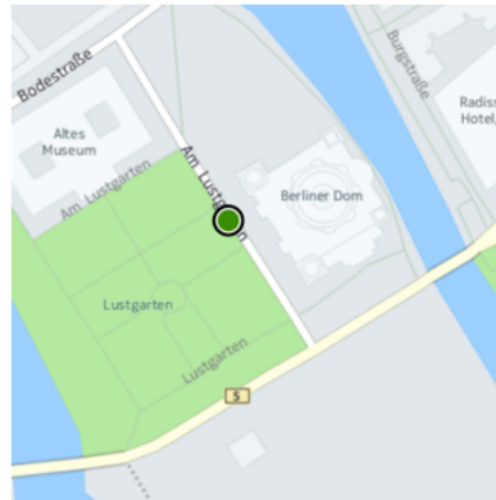
	<p>HERE SDK provides two alternatives to actively fetch map data:</p> <p><b>Map data may be downloaded in the form of map packages for a predefined region or country</b></p> <p><b>Map data may be downloaded for an arbitrary bounding box</b> or a radius around a route</p> <p><b>The first active approach is where you request the download of map data packages which cover an entire country or region</b> using the <code>MapLoader</code> APIs. You do this by selecting from a list of map packages. <b>A map package may be a state (such as California), region, or a country (such as Belgium).</b>”</p>
--	--



Source: [https://developer.here.com/documentation/android-premium/dev\\_guide/topics/map-data.html](https://developer.here.com/documentation/android-premium/dev_guide/topics/map-data.html)  
(emphasis added)

By default the position indicator is rendered as a marker surrounded by a circle, the diameter of which illustrates the accuracy of the indicated position. You can change this marker by calling `PositionIndicator.setMarker(Image)`.

*Figure 1. A PositionIndicator*



Non-circular  
geospatial area

Source: [https://developer.here.com/documentation/android-starter/dev\\_guide/topics/map-positioning.html](https://developer.here.com/documentation/android-starter/dev_guide/topics/map-positioning.html)

determining, based at least in part on the non-circular geospatial zone, an inner circular boundary entirely encompassed within the non-circular geospatial zone, wherein the inner circular boundary is defined by at least the centroid of the non-

The accused instrumentality determines based at least in part on the non-circular geospatial zone (e.g., Maps) an inner circular boundary entirely encompassed within the non-circular geospatial zone, wherein the inner circular boundary is defined by at least the centroid of the non-circular geospatial zone and a minimum radius (e.g., boundary of geofence is set by adjusting the latitude, longitude, centroid and minimum radius.)

circular geospatial zone  
and a minimum radius;

## Asset Distance and Search Radius

For each polygon geofence that covers the asset position or is close to it, the Fleet Telematics Geofencing returns the geofence geometry together with the asset's distance to this geometry.

The asset distance can be influenced by the following factors:

- The asset is outside of the geofence – the distance is the straight line to the closest border of the geofence. This is always the case for line and point geofences.
- The asset is inside the geofence – the distance is the straight line to the closest border of the polygon, with a negative sign.
- The asset is outside of the search radius – the geofence is not listed in the response.
- The asset is inside the polygon but further away from the border of the search radius – a special value indicating "far inside" is returned.

In your application, you can use the asset distance to generate events with different severity levels based on specific distance thresholds. You can also suppress superfluous events if the asset is moving along the geofence border, such as, entering or leaving the geofence frequently without a significant change in the asset distance.

For performance reasons, the asset distances are only straight line distances, not equivalent to driving distances or driving times. Asset distances are limited to approximately 20 kilometers, so a distance can be one of the following:

- within the polygon 250m from the closest border
- within the polygon more than 20km from the closest border
- outside the geofence 333m from the closest border
- outside the geofence more than 20km from the closest border (this value applies to all non-listed geofences, when the asset is outside of the search radius)

Source:

[http://documentation.developer.here.com/pdf/geofencing\\_hlp/2.5.9/Fleet%20Telematics%20Geofencing%20v2.5.9%20Developer's%20Guide.pdf](http://documentation.developer.here.com/pdf/geofencing_hlp/2.5.9/Fleet%20Telematics%20Geofencing%20v2.5.9%20Developer's%20Guide.pdf)

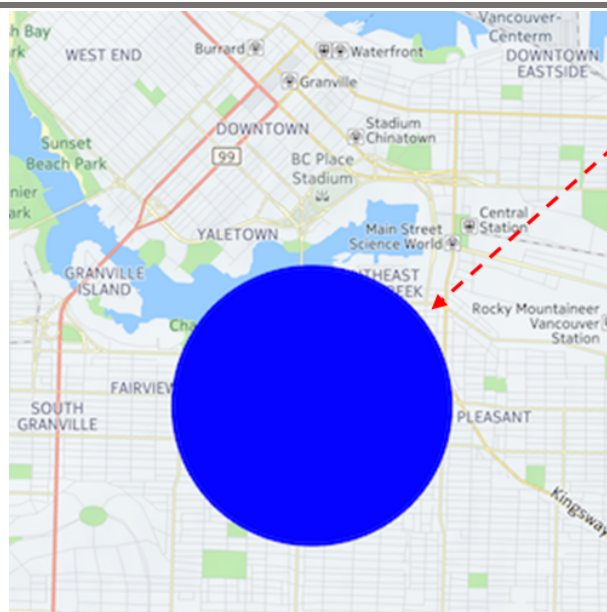
The response to the above request includes the following high level elements:

- List of geoshapes (called **geometries** in the response) with the distance between the geocoordinate and the closest border of the geofence (a negative value indicates the position is inside, a positive value outside of the indicated shape).
- Metadata about the request

```
{
  "geometries": [
    {
      "attributes": {
        "ID": "1",
        "GEOMETRY_ID": "0",
        "NAME": "Alexanderplatz",
        "ABBR": "AL"
      },
      "distance": -99999999,
      "nearestLat": 0,
      "nearestLon": 0,
      "geometry": "MULTIPOLYGON(((13.41252 52.52228,13.41426 52.5221,13.41522 52.52113,13.41227 52.51981,13.41252 52.52228)))"
    }
  ],
  "response_code": "200 OK"
}
```

Source:

[http://documentation.developer.here.com/pdf/geofencing\\_hlp/2.5.9/Fleet%20Telematics%20Geofencing%20v2.5.9%20Developer's%20Guide.pdf](http://documentation.developer.here.com/pdf/geofencing_hlp/2.5.9/Fleet%20Telematics%20Geofencing%20v2.5.9%20Developer's%20Guide.pdf)



Geofence zone as an inner circular boundary having minimum radius

Non-circular geospatial area

Source: <https://developer.android.com/documentation/28.0.0/maps-api/28.0/geofencing>

**“Spatial objects (spatial objects, also referred to as geo shapes in this guide) are circles, rectangles, polylines and polygons and can be used to mark areas on the map. A spatial object is defined by a set of geographical points. The points are translated and scaled as the map is panned and zoomed so that the position of the shape on the display faithfully reflects its geographic location. A spatial object includes styling information, which determines how to trace its outlines and how to fill it (if it is a closed shape).”**

Source: <https://developer.android.com/documentation/28.0.0/maps-api/28.0/geofencing> (emphasis added)

### Adding a Circle to the Map

The example below demonstrates how to add a circle to the map.

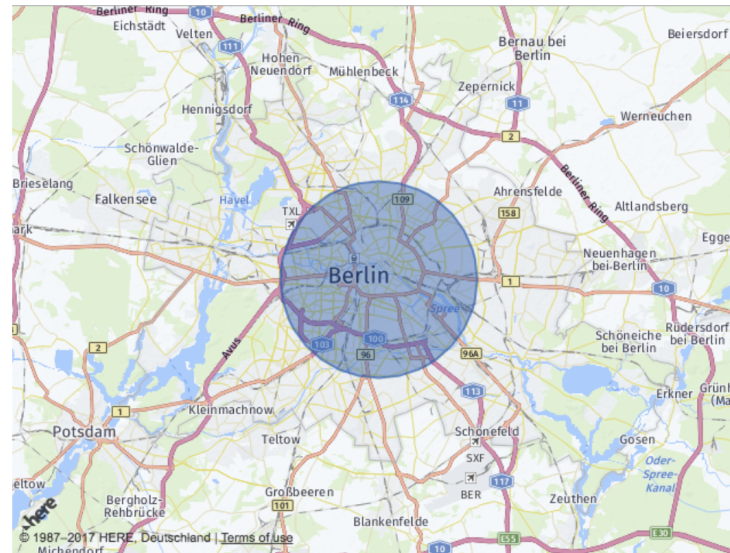
The code creates a map object (see also [Quick Start](#)), instantiates a circle, providing the latitude and longitude of its center and the radius, and finally adds the circle to the map.

```
// Instantiate a map object:  
var map = new H.Map(...);  
  
// Instantiate a circle object (using the default style):  
var circle = new H.map.Circle({lat: 52.51, lng: 13.4}, 8000);  
  
// Add the circle to the map:  
map.addObject(circle);
```

[Copy](#)

The image below shows the result.

Figure 1. Map with a circle



Source: <https://developer.here.com/cn/documentation/maps/hls-chn/topics/spatials.html#spatials>

computing a current distance of the mobile device from the centroid of the non-circular geospatial zone; and

The accused instrumentality computes current distance of the mobile device from the centroid of the non-circular geospatial zone (e.g., Geofencing uses current location of a mobile device to compute the distance from the centroid of the non-circular geospatial zone. Fleet Telematics Geofencing returns the geofence geometry with the asset's distance).

### Asset Distance and Search Radius

For each polygon geofence that covers the asset position or is close to it, the Fleet Telematics Geofencing returns the geofence geometry together with the asset's distance to this geometry.

The asset distance can be influenced by the following factors:

- The asset is outside of the geofence – the distance is the straight line to the closest border of the geofence. This is always the case for line and point geofences.
- The asset is inside the geofence – the distance is the straight line to the closest border of the polygon, with a negative sign.
- The asset is outside of the search radius – the geofence is not listed in the response.
- The asset is inside the polygon but further away from the border of the search radius – a special value indicating "far inside" is returned.

In your application, you can use the asset distance to generate events with different severity levels based on specific distance thresholds. You can also suppress superfluous events if the asset is moving along the geofence border, such as, entering or leaving the geofence frequently without a significant change in the asset distance.

For performance reasons, the asset distances are only straight line distances, not equivalent to driving distances or driving times. Asset distances are limited to approximately 20 kilometers, so a distance can be one of the following:

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Source:

[http://documentation.developer.here.com/pdf/geofencing\\_hlp/2.5.9/Fleet%20Telematics%20Geofencing%20v2.5.9%20Developer's%20Guide.pdf](http://documentation.developer.here.com/pdf/geofencing_hlp/2.5.9/Fleet%20Telematics%20Geofencing%20v2.5.9%20Developer's%20Guide.pdf)

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        "NAME": "Alexanderplatz",
        "ABBR": "AL"
      },
      "distance": -99999999,
      "nearestLat": 0,
      "nearestLon": 0,
      "geometry": "MULTIPOLYGON(((13.41252 52.52228,13.41426 52.5221,13.41522 52.52113,13.41227 52.51981,13.41252 52.52228)))"
    }
  ],
  "response_code": "200 OK"
}
```

Source:

[http://documentation.developer.here.com/pdf/geofencing\\_hlp/2.5.9/Fleet%20Telematics%20Geofencing%20v2.5.9%20Developer's%20Guide.pdf](http://documentation.developer.here.com/pdf/geofencing_hlp/2.5.9/Fleet%20Telematics%20Geofencing%20v2.5.9%20Developer's%20Guide.pdf)

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- `OnPositionChangedListener`
- `PositionIndicator`

**Note:** Android permission `android.permission.ACCESS_FINE_LOCATION` is required when your app calls `PositioningManager.start(LocationMethod)`. Otherwise, the method returns `false`. In addition, to ensure that the app receives location updates, the user needs to have the Location permission enabled (toggled to "on") during runtime.

## PositioningManager Class

A `PositioningManager` class provides information related to the device geographical location like the current position and the average speed. Applications can register to receive position updates using one of the positioning mechanisms described in the `LocationMethod`:

- `GPS` - positioning using the real GPS available on the device
- `GPS_NETWORK` - positioning is provided using a wireless network or the real GPS available on the device
- `NETWORK` - positioning using a wireless network

The current status of a particular location method is represented by the `LocationStatus` value returned from the `PositioningManager.getLocationStatus(LocationMethod)` method.

`PositioningManager` can be accessed by calling `PositioningManager.getInstance()`. An application can start receiving real time positioning updates by calling `PositioningManager.start(LocationMethod)` with one of the location methods listed above and can stop positioning updates by calling `PositioningManager.stop()`. While position updates are being received, an application can retrieve the current position of the client device via `PositioningManager.getPosition()` method.

Source: [https://developer.here.com/documentation/android-starter/dev\\_guide/topics/map-positioning.html](https://developer.here.com/documentation/android-starter/dev_guide/topics/map-positioning.html)

	<p><b>“In / Out / Distance and Search Radius</b></p> <p><b>For each geo fence that covers the asset position (only for polygons), or is close to the asset position, the geo fence geometry is returned, together with the asset distance to the geometry. If the asset is outside (for line and point geo fences it is always outside), then the distance is the airline to the closest border of the geo fence. Also, if the asset is inside, then the distance is the airline to the closest border of the polygon, just with a negative sign. If the asset is further away than the radius of interest (search radius), the geo fence is not listed in the response. If the asset is inside the polygon, but further away from the border than the radius of interest, a special value "far inside" is returned. Providing a distance instead of just in/out allows for more use cases: Applications can generate events with different severity levels for certain distance thresholds. And applications can suppress superfluous events if the asset if "walking along the geo fence border", so entering/leaving frequently without significant change in the distance. For performance reasons, the distances are only air distances (not driving distances or driving times) and they limited to roughly 20 kilometers, so a distance can be "within polygon 250m from the closest border", "within polygon &gt; 20km from the closest border", "outside geo fence 333m from the closest border" or "outside geo fence &gt; 20km from the closest border" (the last one is currently not returned by the service, it is the default i.e. applies to all non-listed geo fences). Events (like entering, leaving, flickering along the border, re-entering...) are not explicitly returned, just distances. The same applies to sequences of events (like entered 3rd time, left 2nd time within a day...)."</b></p> <p>Source:  <a href="http://documentation.developer.here.com/pdf/geofencing_nlp/1.1/Geofencing%20Extension%20API%20v1.1%20Developer's%20Guide.pdf">http://documentation.developer.here.com/pdf/geofencing_nlp/1.1/Geofencing%20Extension%20API%20v1.1%20Developer's%20Guide.pdf</a></p>
<p>in response to a determination that the computed current distance both exceeds the minimum radius and does not exceed the maximum radius, utilizing the non-circular geospatial zone</p>	<p>The accused instrumentality determines that the computed current distance both exceeds the minimum radius and does not exceed the maximum radius and utilizes the non-circular geospatial zone to determine a context of the mobile device (e.g., based on location and motion (context) of the mobile device, the geofence zone is calculated using computed current distance. The computed distance can be used to provide features using the context information fetched from the mobile sensors such as restricted access to certain areas, alert the warehouse, alerting about package delivery, notifying taxi services, notify car rental agencies etc.)</p>

to determine a context of the mobile device.

### **Test Geocoordinates**

To test whether a set of geocoordinates are within a set of geoshapes available to the Fleet Telematics Geofencing, send the following GET request.

The response to the above request includes the following high level elements:

- List of geoshapes (called *geometries* in the response) with the distance between the geocoordinate and the closest border of the geofence (a negative value indicates the position is inside, a positive value outside of the indicated shape).
- Metadata about the request

```

{
  "geometries": [
    {
      "attributes": {
        "ID": "1",
        "GEOMETRY_ID": "0",
        "NAME": "Alexanderplatz",
        "ABBR": "AL"
      },
      "distance": -99999999,
      "nearestLat": 0,
      "nearestLon": 0,
      "geometry": "MULTIPOLYGON(((13.41252 52.52228,13.41426 52.5221,13.41522 52.52113,13.41227 52.51983"
    }
  ],
  "response_code": "200 OK"
}

```

Source: [https://developer.here.com/documentation/geofencing/dev\\_guide/topics/quick-start-test-geocoordinates.html](https://developer.here.com/documentation/geofencing/dev_guide/topics/quick-start-test-geocoordinates.html)

Table 1. Main features of the HERE Fleet Telematics Geofencing

Feature	Description
Close access to certain areas in cities	Based on various requirements, you can specify areas in a city as no-go areas for assets at certain times of the day or week. For example, if the assets should avoid areas with heavy traffic during peak hours. For each asset group, there is a static set of polygons defined where the assets and/or management system is alerted if an asset approaches or enters the no-go area. These polygons can have individually defined validity periods.
Alert the warehouse 15 minutes before a mobile asset arrives	To prepare for a delivery, warehouses want to be notified when a mobile asset, such as a truck, is less than 15 minutes away. The isochrone polygons around each warehouse can be: <ul style="list-style-type: none"> <li>static – computed using reverse isoline routing via the <a href="#">HERE Routing API</a></li> <li>dynamic – according to a weekly recurring traffic pattern or current live traffic situation</li> </ul> The validity period for each polygon can be the warehouse's opening hours.
Alert the end user 15 minutes before a package arrives	To prepare for a postal or drone delivery, end users want to be notified when a mobile asset, such as a delivery truck, person, or a drone, is less than 15 minutes away. End users are entered on the fly as isochrone polygons, as soon as the delivery process starts. Each mobile asset is then checked against one user polygon.
Notify taxi service if there are less than five (5) cars within a hot spot polygon	In the vicinity of a train station or a stadium, after a big event, there should be sufficient cars within 3 minutes reach to be ordered by users. In this case, many static and a few dynamic polygons are defined. The alerts are not for individual assets but for the total number of assets within a polygon. Currently, fleet management systems must maintain the number of polygon themselves and trigger alerts in case of an underflow.
Alert a consumer when he or she is close to a shop	For advertising purposes, while the mobile asset such as a car driver or a pedestrian, is moving, an advertisement alerts the consumer if a particular shop or restaurant is close by. The validity period for each static polygon or point can be the respective opening hours.
Notify the car rental agency if an asset enters a forbidden country or area	Certain groups of rental cars have a restricted set of countries or areas where their use is permitted, due to insurance or security reasons. In this case, you can define a few static polygons that extend across a large geographic area with a fine grained resolution (number of vertices) per asset group. Or you can simply use the existing PDE country boundary layer as geofences.

Source: [https://developer.here.com/documentation/geofencing/dev\\_guide/topics/what-is.html](https://developer.here.com/documentation/geofencing/dev_guide/topics/what-is.html)

### **Map Layers as Geofences**

Geofences can be custom defined objects, but Fleet Telematics Geofencing also allows to geofence on all map content. Examples:

- Check whether the asset is in woodland, builtup, lake, ocean, park, hospital, beach or airfield. Therefore geofence against the corresponding PDE cartographic polygon layers.
- Check whether the asset is close to a restaurant, hotel, train station or fuel station. Therefore geofence against the corresponding PDE Point of Interest layers.
- Check whether the asset is on or close to a railway line, small river line or country border line. Therefore geofence against the corresponding PDE cartographic line layers.
- Check whether the asset is on a motorway, federal road, small road or pedestrian path. Therefore geofence against the corresponding PDE road geometry layers, and join PDE road information layers.

Please refer to the PDE Developer Guide for available layers. Geofencing on maps uses the same resources as geofencing on custom polygons, but a different service endpoint.

Source: [https://developer.here.com/documentation/geofencing/dev\\_guide/topics/map-layers-as-geofences.html](https://developer.here.com/documentation/geofencing/dev_guide/topics/map-layers-as-geofences.html)

### Non-circular geospatial area